

Claims

- [c1] A system for producing portions of ground meat having a predetermined target weight comprising:
- a pump assembly that is capable of extruding a stream of ground meat;
 - a conveyor that is capable of transporting the stream of ground meat from the pump assembly;
 - a portioning mechanism that is capable of separating the stream of ground meat into a plurality of portions;
 - a weighing mechanism that is capable of weighing each portion of the plurality of portions; and
 - at least one filling mechanism that provides an additional amount of ground meat to each portion of the plurality of portions so that each portion of the plurality of portions can substantially attain the predetermined target weight.
- [c2] The system for producing portions of ground meat having a predetermined target weight according to Claim 1, wherein the pump assembly includes a hopper assembly capable of receiving ground meat and a main displacement assembly.
- [c3] The system for producing portions of ground meat hav-

ing a predetermined target weight according to Claim 2, wherein the main displacement assembly includes a vacuum pump capable of applying a vacuum to ground meat located in the hopper assembly.

[c4] The system for producing portions of ground meat having a predetermined target weight according to Claim 2, wherein the main displacement assembly includes a drive mechanism operatively connected to a plurality of rotatable vanes capable of moving ground meat out of a feed tube and onto the conveyor.

[c5] The system for producing portions of ground meat having a predetermined target weight according to Claim 4, wherein the drive mechanism includes a motor operatively connected to a rotor.

[c6] The system for producing portions of ground meat having a predetermined target weight according to Claim 4, wherein the drive mechanism includes a motor that is operatively connected to a location monitoring mechanism and the location monitoring mechanism is electrically connected to an electronic control, wherein the electronic control is able to control speed of the conveyor based on input from the location monitoring mechanism.

- [c7] The system for producing portions of ground meat having a predetermined target weight according to Claim 6, wherein the electronic control utilizes closed loop feedback to provide a speed for the conveyor that is responsive to an output of ground meat from the pump assembly.
- [c8] The system for producing portions of ground meat having a predetermined target weight according to Claim 6, wherein the location monitoring mechanism is selected from the group consisting of an optical encoder, a mechanical encoder, a magnetic indexing encoder, an optical resolver, a mechanical resolver, a magnetic indexing resolver, an absolute rotary encoder, an incremental rotary encoder, a linear encoder, a rotary position sensor, an angular position sensor, a potentiometer, a noncontact magnetic sensor and a capacitive sensor.
- [c9] The system for producing portions of ground meat having a predetermined target weight according to Claim 1, further comprising an electronic control that is operatively connected to the conveyor, whereby the electronic control is capable of controlling the speed of the conveyor and density of the stream of ground meat.
- [c10] The system for producing portions of ground meat having a predetermined target weight according to Claim 9,

wherein the conveyor is servo-controlled.

- [c11] The system for producing portions of ground meat having a predetermined target weight according to Claim 1, wherein the portioning mechanism includes an extrusion grinder.
- [c12] The system for producing portions of ground meat having a predetermined target weight according to Claim 1, wherein the portioning mechanism includes a guillotine knife.
- [c13] The system for producing portions of ground meat having a predetermined target weight according to Claim 1, further comprising a container dispenser positioned after the portioning mechanism over the conveyor that is capable of placing each portion of the plurality of portions into a separate container.
- [c14] The system for producing portions of ground meat having a predetermined target weight according to Claim 13, wherein the conveyor includes an accelerated portion for separating the portions of ground meat and a decelerated portion located underneath the container dispenser.
- [c15] The system for producing portions of ground meat having a predetermined target weight according to Claim 1,

further comprising an electronic control that is capable of receiving at least one weight measurement from each of the plurality of portions of ground meat with the weighing mechanism and comparing the weight measurements with a target weight, wherein the electronic control is able to increase the speed of the conveyor if the at least one weight measurement is greater than the target weight and decrease the speed of the conveyor if the at least one weight measurement is less than the target weight.

[c16] The system for producing portions of ground meat having a predetermined target weight according to Claim 1, further comprising an electronic control that is capable of receiving a plurality weight measurements from the plurality of portions of ground meat with the weighing mechanism and comparing an average weight measurement with a target weight, wherein the electronic control is able to increase the speed of the conveyor if the average weight measurement is greater than the target weight and decrease the speed of the conveyor if the average weight measurement is less than the target weight.

[c17] The system for producing portions of ground meat having a predetermined target weight according to Claim 1, wherein the weighing mechanism includes an inline

scale.

[c18] The system for producing portions of ground meat having a predetermined target weight according to Claim 1, wherein the at least one filling mechanism includes a supply press that is operatively attached to a main chamber, having an upper portion and a lower portion, wherein the supply press is capable of injecting ground meat into the main chamber and a secondary press that is operatively connected to the upper portion of the main chamber, wherein the secondary press is capable of applying pressure to ground meat located within the main chamber and a gating mechanism that is operatively connected to the lower portion of the main chamber and is capable of selectively releasing an additional amount of ground meat into each portion of the plurality of portions.

[c19] The system for producing portions of ground meat having a predetermined target weight according to Claim 18, wherein the supply press includes a first cylinder having a piston located within the first cylinder and capable of applying pressure to a push plate located within a supply cavity, wherein the push plate is capable of supplying ground meat to within the main chamber.

[c20] The system for producing portions of ground meat hav-

ing a predetermined target weight according to Claim 18, wherein the secondary press includes a holding cap, having a top portion and a bottom portion, wherein a second cylinder is operatively attached to the top portion of the holding cap and a piston is operatively attached to the second cylinder, wherein the piston is capable of moving within the upper portion of the main chamber and is capable of applying pressure to ground meat located within the main chamber.

[c21] The system for producing portions of ground meat having a predetermined target weight according to Claim 18, wherein the gating mechanism includes an inlet, an outlet and a third cylinder, having a piston, and an orifice located in between the inlet and the outlet and in fluid communication therewith, wherein the piston is able to enter the orifice to selectively block passage of ground meat between the inlet and the outlet of the gating mechanism.

[c22] The system for producing portions of ground meat having a predetermined target weight according to Claim 21, further comprising a control mechanism that is electrically connected to the third cylinder to selectively move the piston to control an additional fill of ground meat into each portion of the plurality of portions.

[c23] The system for producing portions of ground meat having a predetermined target weight according to Claim 13, further comprising a container sealing mechanism located after the at least one filling mechanism for sealing ground meat within each of the separate containers.

[c24] The system for producing portions of ground meat having a predetermined target weight according to Claim 1, wherein the at least one filling mechanism includes a first filling mechanism that is removably mounted in a first holster and a second filling mechanism that is removably mounted in a second holster, wherein the first filling mechanism and the second filling mechanism alternately operate in sequence and are positioned over a filling conveyor.

[c25] A process for producing portions of ground meat having a predetermined target weight comprising:
extruding a stream of ground meat with a pump assembly;
transporting the stream of ground meat from the pump assembly with a conveyor;
separating the stream of ground meat into a plurality of portions with a portioning mechanism;
weighing each portion of the plurality of portions with a weighing mechanism; and
providing an additional amount of ground meat to each

portion of the plurality of portions with at least one filling mechanism that so that each portion of the plurality of portions can substantially attain the predetermined target weight.

[c26] The process for producing portions of ground meat having a predetermined target weight according to Claim 25, wherein the extruding a stream of ground meat with a pump assembly includes receiving ground meat in a hopper assembly and applying a vacuum to the ground meat located in the hopper assembly with a vacuum pump and then rotating a plurality of vanes with a drive mechanism to move the ground meat out a feed tube within the pump assembly and onto the conveyor.

[c27] The process for producing portions of ground meat having a predetermined target weight according to Claim 26, wherein the rotating a plurality of vanes to move the ground meat out a feed tube includes monitoring a location of rotation of the plurality of vanes with a location monitoring mechanism and then controlling the speed of the conveyor.

[c28] The process for producing portions of ground meat having a predetermined target weight according to Claim 25, wherein the transporting the stream of ground meat from the pump assembly with a conveyor includes utiliz-

ing an electronic control to control the speed of the conveyor.

[c29] The process for producing portions of ground meat having a predetermined target weight according to Claim 25, further comprising placing each portion of the plurality of portions into a separate container with a container dispenser.

[c30] The process for producing portions of ground meat having a predetermined target weight according to Claim 25, further comprising adding an additional amount of ground meat into each portion of a plurality of portions with at least one filling mechanism that includes injecting ground meat from a supply press into a main chamber, applying pressure to the main chamber with a secondary press and then selectively releasing ground meat from the main chamber with a gating mechanism.

[c31] The process for producing portions of ground meat having a predetermined target weight according to Claim 29, after the providing an additional amount of ground meat to each portion of the plurality of portions with at least one filling mechanism so that each portion of the plurality of portions can substantially attain the predetermined target weight then sealing each of the separate containers with a container sealing mechanism.

[c32] The process for producing portions of ground meat having a predetermined target weight according to Claim 25, wherein the providing an additional amount of ground meat to each portion of the plurality of portions includes utilizing two filling mechanisms alternately operating in sequence with the plurality of portions being transported by a filling conveyor positioned underneath the two filling mechanisms.